Phasing out coal, sustaining coal communities? Living with technological decline in sustainability pathways

Introduction

The need to phase out 'unsustainable' technologies, in particular, the use of coal-fired power stations for electricity production and relatedly, coal mining activities, is becoming an increasingly important policy agenda across Europe (DECC 2016; European Commission 2015; Schulz & Schwartzkopff 2015). In the UK, specific announcements have been made to phase out coal by 2025 (DECC 2016; Littlecott 2015), where it is increasingly suggested that a more rapid coal phase out will be essential if there is any chance of meeting EU emissions reductions targets (Cuff 2015). The need to phase out the use of coal-fired power has been recognised as a priority for climate policy in the UK for some time (DTI 2003). Use of coal is in decline highlighted by UK energy production experiencing its first coal free day since the 1880s (Brown 2017). Various milestones indicative of momentum towards coal phase out have taken place. This includes the closure of the last operating coal fired power station in Scotland (Macalister 2016) and the closure of the last operating deep coal mining colliery in the UK. Meanwhile, in 2016 renewables produced more electricity than coal (Darby 2016), and the UK experienced its first coal free day as a result of the impressive growth of renewables in the electricity generation mix (Brown 2017).

From the perspective of the burgeoning academic field of 'sustainability transitions' (Augenstein & Palzkill 2016), which seeks to understand and sometimes motivate transformations towards low carbon futures (Markard et al. 2012), at face value, the UK coal policy is being disrupted by new niche-based technologies (such as renewable energy), signalling the momentum of a 'regime shift' to more sustainable futures (Kemp et al. 1998; Markard et al. 2012). With policy announcements for the deliberate phase out of coal by 2025, UK energy policy also entails policy instruments directed at the more deliberate destabilisation of unsustainable technological trajectories (Turnheim & Geels 2013; Turnheim & Geels 2012; Karltorp & Sandén 2012). Such instruments are increasingly deemed necessary in order to 'accelerate' sustainability transitions (Bromley 2016).

In this short comment article, we discuss recent attention towards phase out policies and associated understandings of destabilisation and discontinuation derived from the field of sustainability transitions. While the recent focus on destabilisation of unsustainable technologies in this field is valuable, we raise concerns that there is the risk of insufficient attention regarding the broader implications of such discontinuity processes around the impacts on local coal communities and future prospects of the workforce. Indeed, while the starting point of analysis in sustainability transitions research is understandably *from above* in terms of an analysis of coal phase out in the overall context of the UK's national climate and energy policy, coal phase out is of course regionally uneven, and has important implications in terms of structural change in the economy, skills jobs, and community livelihood.

Viewing coal phase out *on the ground* examines the final closure of coal-fired power stations as an end stage in the long process of the closure of the coal economy in the UK and the broader deindustrialisation of Britain more generally. Exposed to economic pressures, UK coal was experiencing decline for a large part of the 20th century (Turnheim & Geels 2012), however, the rate of change intensified in the 1970s and in the 1980s especially under the Conservative Government of Margaret Thatcher with coal fields closing rapidly. The number of jobs in the coal economy dropped from 221,000 in 1985 to 7,000 in 2005 (Beatty 2005). Studies show that this rapid closure has had lasting impacts with former coal communities facing structural problems around higher levels of unemployment, incapacity benefit claims, and fewer available job positions that are still felt today (Foden et al 2014). As Elliot (2016) notes, spending power was removed from these deindustrialising regions, and they have never

recovered with high skill and high wage industrial jobs replaced by fewer low paid jobs and insecure work in the service sector.

As the last coal-fired power stations close this broader process of industrial decline should be considered. This is not to call for a change to the coal phase out policy which is essential in meeting CO2 mitigation targets and can be seen as a progressive and bold decision by the UK government, or to wrongly equate coal mining and coal fired power as one and the same. This perspective can however, provide a shift in focus to shine a light on new questions and areas of concern that arguably should be more central in energy policy research. Yorkshire also has two coal-fired power stations in operation, so when these close it will signal the end of the once dominant coal economy in this region. Given the emissions and health implications of coal economies this is clearly an essential policy. However, by focussing on the long legacy of deindustrialisation and the uneven impacts of this for regions such as Yorkshire, new future-oriented questions regarding jobs, economy and community cohesion come to the foreground. In short, what role will communities and workers in regions like Yorkshire that bore the brunt of the economic 'losses' involved in the long march away from fossil economies, play in seizing the gains of new green industrial policy centred around low carbon technological futures? For some participants in the UK coal phase out consultation, these deeper and more complex questions regarding communities, employment and cultural identity that are highly entangled between work place and social life, have not been sufficiently considered within the transitions literature and UK policymaking.

Viewing coal phase out in the broader context of deindustrialisation related particularly to Northern parts of England, shifts the focus from the importance of coal phase out for climate mitigation ambitions which are a given, to interrogating whether the UK coal phase can be implemented as part of a 'just transition', a concept advocated by parts of the trade union movement (ILO 2015; ACTU 2016). In order to more fully account for broader sets of issues around community impacts relevant to just transitions, understanding coal phase out in areas such as Yorkshire in the context of broader changes in social cultural identities through processes of deindustrialisation, whilst drawing on sociological and human geography perspectives (Strangleman 2016; Strangleman 2001), may be useful. Such literatures place emphasis on the complex processes of social, cultural and material re-orderings that encapsulate issues around social networks, and community cohesion that should be taken into account to understand how phase out is experienced and lived with 'on the ground' as well as how it is 'seen from above' by the 'policy maker'. The need to phase out coal for the good of the planet is clear however, questions regarding what kind of future can be built around a low carbon economy for regions such as Yorkshire remain open.

Sustainability transitions & the coal phase out in the UK

Sustainability transitions is a broad field of research which seeks to understand how transitions to low carbon futures can be enacted. The Multi-Level Perspective (MLP) (Geels 2002) has focussed on the dynamics taking place at the 'niche' and 'regime' level (and to a lesser extent the level of the 'landscape'). The regime represents the stable level of the prevailing fossil fuel based technological trajectory where markets, business models, rules, and regulations, are oriented in a fashion that sustains this trajectory making it hard for new low carbon technologies to 'break through' as they do not 'fit' with the prevailing logics of the regime level (Berkhout et al. 2004). The predominant way of understanding the main driver behind sustainability transitions has been in terms of the support and empowerment of new niche technologies and innovations, where niches could diffuse and reconfigure activities at the regime level thereby enacting a 'regime shift' to more sustainable forms of economic production (Kemp et al. 1998). As such, much of the work focussed on understanding policy orientations around supporting sustainable niches to develop such as 'strategic niche management' (Raven 2005; Witkamp et al. 2011), and 'transition management' approaches (Rotmans & Loorbach 2008) .

However, it became clear from the research of sustainability transitions scholars that policy interventions often aimed at promoting frameworks around supporting niche developments were slowed or curtailed by powerful vested interests in terms of fossil fuel industries (Smith & Kern 2009; Kemp et al. 2007; Hendriks & Grin 2007). Therefore, scholars started to argue that the promotion of new and innovative low carbon technologies alone may not necessarily bring about the speed of transition deemed necessary when the evidence of the potential timescales at which emissions reductions have to take place to avoid dangerous climate change are considered (IPCC 2012). As a consequence, several scholars have begun to pay more attention to various 'flip sides' to innovation, or what is identified as the 'destructive' part of Schumpeterian 'creative destruction' (Kivimaa & Kern 2015; Rogge & Reichardt 2013; Rogge et al. 2015) examining how dominant technological trajectories in particular, 'fossil fuel regimes', can be 'destabilised' (Turnheim & Geels 2012; Turnheim & Geels 2013). More recently, some sustainability transition scholars have investigated the governance of the active 'discontinuation' of incumbent technological pathways (Stegmaier et al. 2014; Stegmaier et al. 2012). The significance of phase out policies directed at centralised 'incumbent' technologies is based around the idea that speedier deployments of renewables and other low carbon policy interventions would be initiated (Lawrence et al. 2016) as a consequence.

The coal phase out in the UK is a clear example of a discontinuation policy where government aims to deliberately end a certain technological trajectory (Stegmaier et al. 2014). The positives of such a policy decision are clear and well known - the policy which would see the UK be the first major economy to manage the end of coal power, and the closure of UK coal fired power stations is estimated to save around 25 billion tonnes of Carbon dioxide being emitted (Littlecott 2015). However, there is a danger that this complex issue is viewed too narrowly through the 'master signifier' of carbon dioxide reductions alone, symptomatic of a 'post political' condition (Swyngedouw 2009; Swyngedouw 2010; Wilson & Swyngedouw 2014), where all other substantial issues are trumped by the overriding 'urgency' to reduce emissions. Discontinuation policies emphasis the socially embedded nature of energy technologies, but there is room for more analysis regarding the broader implications of such discontinuity processes for coal communities in terms of jobs, future of communities, social and cultural significances, 'diversification' strategies and so on. This is not to suggest demoting the importance of carbon dioxide: on the contrary it suggests that in order to facilitate transitions to sustainability that are equitable and have a wide range of actors on side, more attention needs to be payed to often neglected actors such as trade unions and local communities surrounding technologies actively being abandoned and how they will play a future role in new emerging technological systems based around low carbon alternatives.

Here, the phasing out of coal-fired power stations is not simply about switching off 'dirty' technologies but is connected to broader changes of the social, cultural, political and material ordering of the world, influencing relationships to place, community cohesion, and labour processes encapsulated in the discontinuation of 'unsustainable' technologies. In the following section, we briefly discuss some of the issues emerging around the proposed coal phase out that include actors (such as trade unions) and perspectives regarding job security that highlight the varied concerns that exist when phase out policies are considered. By bringing these perspectives to the fore, we argue that important issues are raised that need to be considered when thinking about the broader 'sustainability' of certain phase out policies beyond narrow understandings of climate policy.

Broader impacts of the UK coal phase out

The 2016 coal consultation outlined by the UK government, was based around understanding *"how to take action to regulate the closure of unabated coal to provide greater market*

certainty for investors in the generation capacity that is to replace coal stations as they close, such as new gas generators" (BEIS 2016: 6). It focused on issues including changes to the capacity market, security of supply and possible obligations on coal producers, as well as *wider impacts of these proposals*, which we focus on here.

The consultation document recognized that direct job losses of 150-200 for a large coal fired power plant, supply chain jobs in shipping and freight, as well as effects on local businesses and suppliers in nearby communities as areas of concern. Yet, it must be noted that in the impact assessment of coal phase out published at the same time as the consultation, no assessment of the impact on local communities was conducted. This lack of attention on coal communities of a proposed phase out was picked up by the *Coal Action Network's* (CAN 2016) response to the consultation document, arguing that social issues need to be more prioritized within the phase out of coal.

Moreover, *Prospect*, a trade union, also raised concerns over the lack of emphasis placed on issues of employment arguing that *"this proposal remains silent about the skills challenges posed by a significant change in generation technology*" (Prospect 2017: 7). The response by *Energy UK* emphasized that direct employment from coal was 8,000 when the entire supply chain was considered, and that *"BEIS should consider the linkage between the proposed closure programme and the development of the Industrial Strategy"* in order to mitigate these job losses (p.6). This echoes concerns raised elsewhere, for example, at the Annual Coal Industry Meeting in 2016, where it was argued that *"more should be done to help retain these skills within the UK and facilitate redeployment of the workforce to other parts of the energy sector"* (ACI 2016).

It may be that given time, government takes fully into consideration these points, however their absence upfront in the government's consultation raises concerns that they may not be fully planned for. As stated elsewhere, it is argued that a key challenge is that *"government needs to come up with a proactive set of interventions that will retrain and reskill workers from high-carbon sectors, so that they can move into emerging low-carbon sectors"* (Power Engineering International, 2016). Yet with grave uncertainties and lack of political will around some renewable technologies in the UK, the abandonment of CCS, and large emphasis placed on new nuclear that is severely delayed and in crisis, means that the overall vision of where the UK energy system is headed is at the time of writing, difficult to ascertain.

It is also important to consider the specific regional dynamics of ending coal use, especially in relation to how it unevenly impacts regions of the UK, some of which have already incurred significant impacts as a result of the rapid closure of coal mining. A case in point, is the recent closure of Ferrybridge C coal fired power station which had supplied power to the UK grid for over 50 years. Although only 150 people were directly employed a range of auxiliary services and supply chain activities existed around the site. This coal fired power station closed soon after the last deep coal mine in the UK, Kellingley Colliery which employed 700 people, located a few miles from the power station, closed in 2015. The closure of both these coal-related sites was a "double whammy" for the surrounding area in terms of the local economy (Yorkshire Post 2016).

For some actors in this region, it is difficult to disentangle the closure of coal fired power from the emotive historical experience of the rapid closure of coal mining and other heavy industries in the area. The effects of the closure of coal mining in Yorkshire is still felt today, with former coal communities tending to be poorer with higher than the UK average rates of unemployment and a lack of job opportunities (Foden et al. 2014). As Yvette Cooper, the MP for Pontefract and Castleford the constituency in which Ferrybridge and Kellingley are located outlined in the Houses of Parliament (Cooper 2015), that the effects of both Kellingley and Ferrybridge C closing in quick succession would be profound in terms of the

potential loss of skilled labour. So, a key question arguably remains as to what role can the communities and workers in an area like Pontefract and Castleford that was so pivotal to the energy production of 20th century Britain play in the rapidly evolving British energy system of the 21st century, and whether the costs and benefits of sustainability transitions are being shared equitably across a range of actors and geographical locations in the UK.

Towards the Just transition in the context of deindustrialization

Recent academic work in sustainability transitions that interrogates the phase out of carbon intensive technologies and makes use of concepts such as destabilization and discontinuation has provided insightful findings regarding the hitherto under-examined 'flip side' of innovation theory. This analysis is timely, considering that the discontinuation of once dominant technological trajectories such as the nuclear phase out in Germany, Norway's plans to phase out petrol and diesel cars, or the UK's coal phase out, are becoming key policies driven by climate change concerns, yet have traditionally been understudied in the literature.

With respect to coal, the imperative for phase out is clear. As outlined in a report by the Climate Analytics group (Climate Analytics 2017), all European coal-fired power stations need to be phased out by 2030 or Europe runs the risk of considerably overshooting its agreed climate mitigation targets. But arguably, the key question is no longer whether coal needs to be phased out or not, but rather, what are the key issues, actors, and policies required to ensure a transition that is not just sustainable in the sense of contributing towards carbon reduction targets, but also sustainable in terms of local economic and social issues relevant to those regions such as Yorkshire where the phase out of coal fired generation will be most profoundly felt.

With the recent attention towards discontinuation policies in sustainability transitions, given the pressing scientific rationale for implementing coal phase out, there is a potential risk of presenting narrow selective frameworks of what phase out entails based around carbon dioxide reduction and technological that cater to the perspective 'from above' seen by the often elusive figure of the 'policy maker'. But this may script out some of the complexities and focal issues that are seen 'from below' by communities and workers and those with less access to the policy process. This is where the work in sustainability transitions could more usefully engage with the framework of the 'just transition' as advocated in the trade union movements (ILO 2015; ACTU 2016), as well as geographical and sociological perspectives that have explored issues of deindustrialization in terms of the temporal, place-based and political dynamics entailed in such processes. Trade Unions are thinking hard about issues of work and justice in relation to climate change and energy and phase out in particular (Hampton 2015), yet they remain elusive actors in sustainability transitions literatures.

Ideas of a 'just transition' are being increasingly discussed for example by the European Trade Union Confederation (ETUC) where this notion entails paying *"greater attention to the adverse consequences of decarbonisation and address them through concrete and effective policies specifically targeting workers from sectors and regions which could be negatively impacted by the transition to a low-carbon economy"* (ETUC 2016: 46), while *"ensuring a broad participation of local social partners is essential to the success of low-carbon industrial strategies at local level"* (ETUC 2016: 5). With the absence of attention towards community impact in the UK coal phase out thus far, it is not clear that the policy discussions around coal phase out in the UK are paying enough attention to the broader sets of concerns that workers and communities in regions such as Yorkshire are considering when phase out is being discussed. While it may seem expedient to encapsulate phase out in terms of objective requirements of carbon dioxide reduction and narrow views of technological replacement in order to deliver satisfying messages to policy makers, not fully addressing the concerns of trade unions and local communities in the phase out process may be counter-productive. In

the long run, the marginalization of trade unions and local communities from decision making processes regarding phase out and future energy trajectories may lead to opposition towards sustainability transitions and climate action more generally, if such momentous technological change is viewed as one that endangers livelihoods and community cohesion.

But getting to grips with the broader and less visible issues arguably requires a different starting point in terms of the energy system, moving away from the perspective of the rational policy maker overseeing the energy system in question, to beginning the point of analysis from the perspective of citizens and communities 'on the ground', and what the salient factors are regarding phase out policies from such a vantage point. The closure of coal-fired power stations in places such as Yorkshire are not simply matters of climate policy, but also part of complex legacies of deindustrialisation that continue long after the plant or mine has closed, manifested in *"long-term economic struggles, the slow, continuing decline of working-class communities, and internalized uncertainties as individuals try to adapt to economic and social changes"* (Linkton quoted in Strangleman 2016).

Coal technologies were woven into the everyday fabric of Yorkshire, and "…*transformed and shaped the region, embedding cultural traditions and social identities"* (Kirk et al. 2012: 184). With regards to Yorkshire, as the last coal fired power plants finish their life in this already heavily deindustrialised region, alongside policy prescriptions directed at phasing out from the perspective of national energy transitions, understanding how community cohesion and social networks in areas will be reconfigured and sustained as new energy futures emerge is crucial as part of fostering more just transitions. As the end stage of the coal age nears in Yorkshire, the legacies of the rapid phase out of coal mining are arguably still seen today with these regions continuing to experience economic marginalisation which some argue has partly contributed to political dissatisfaction and alienation manifested in recent years (Thorleifsson 2016).

It is imperative therefore, that as coal phase out is rightfully given increasing policy attention, those regions and communities that have already incurred significant impacts and potential neglect through the transition away from coal economies, are not further alienated by the phasing out of coal fired power stations. As 2025 draws nearer, only time will tell whether the UK coal phase out will be part of a just transition and whether it is possible to sustain some of the positive social and cultural aspects of coal communities while at the same time discontinuing coal fired power.

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